VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a Minor, Municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards (WQS) of 9VAC25-260. The discharge results from the operation of a sewage treatment plant (SIC Code: 4952 - Sewerage Systems). This permit action consists of reissuing the permit with revisions to the permit, as needed, due to changes in applicable laws, guidance, and available technical information.

1. Facility Name and Address:
   Harrisonburg/Shenandoah Valley KOA
   12480 Mountain Valley Road
   Broadway, VA 22815
   Location: 12480 Mountain Valley Road, Broadway

2. Permit No. VA0088994; Expiration Date: August 31, 2015

3. Owner: John A. Hucul
   Contact Name: Same
   Title: Owner
   Telephone No: (540) 896-8929
   Email: huculj@yahoo.com

4. Description of Treatment Works Treating Domestic Sewage:
   Total Number of Outfalls: 1

   This facility serves a campground and the owner's residence. The facility treats 100% sanitary wastewater.

   Average Discharge Flow (February 2013– February 2015) = 0.003 MGD
   Design Average Flow = 0.01 MGD

5. Application Complete Date: March 9, 2015

   Permit Writer: Megan O'Gorek Date: May 13, 2015
   Reviewed By: Dawn Jeffries Date: May 18, 2015

   Public Comment Period:

6. Receiving Stream Name: War Branch
   River Mile: 4.45
   Use Impairment: Yes
   Special Standards: pH, PWS
   Tidal Waters: No
   Watershed Name: VAV – B47R Smith Creek
   Basin: Potomac; Subbasin: Shenandoah
   Section: 6e; Class: IV

7. Operator License Requirements per 9VAC25-31-200.C: None

8. Reliability Class per 9VAC25-790: Class II (Assigned September 29, 1995)

9. Permit Characterization:
   ☑ Private ☐ Federal ☐ State ☐ POTW ☐ PVOTW
   ☐ Possible Interstate Effect ☐ Interim Limits in Other Document (attach copy of CSO)

10. Discharge Location Description and Receiving Waters Information: Appendix A

11. Antidegradation (AD) Review & Comments per 9VAC25-260-30:
    Tier Designation: Tier 1

    The State Water Control Board's WQS include an AD policy. All state surface waters are provided one of three levels of AD protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 waters have water quality that is better than the WQS. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 waters are exceptional waters and are so designated by regulatory amendment. The AD policy prohibits new or expanded discharges into exceptional waters.

    The AD review begins with a Tier determination. During the 1995 permit issuance, War Branch in the vicinity of the discharge was determined to be Tier 1 based to this facility's historical TRC effluent concentration. As a result, when the VPDES permit was issued in 1995 and reissued in 2000, chlorine was fully allocated. At the 2005 reissuance, the receiving stream was initially evaluated as a Tier 2 water in conformance with DEQ guidance regarding Tier 1 waters that were previously fully allocated for chlorine. During that evaluation, it was determined that the facility required limits for Ammonia-N. Since the facility never had Ammonia-N limits, it was given the full allocation for Ammonia-N. As a result, the receiving stream will continue to be designated as Tier 1. Because this facility discharges to Tier 1 waters, antidegredation baselines are not required; however, permit limits were set such that all downstream WQS will be maintained.

12. Site Inspection: Performed by Megan O'Gorek on May 12, 2015

13. Effluent Screening and Effluent Limitations: Appendix B

14. Effluent toxicity testing requirements included per 9VAC25-31-220.D: ☐Yes ☑ No

    This facility does not have a design flow $\geq$ 1.0 MGD, has no Significant Industrial Users (SIUs) or Categorical Industrial Users (CIUs), and is not deemed to have the potential to cause or contribute to instream toxicity.

15. Sewage sludge will be transported North River WWTF (VA0060640) for treatment and disposal. The VPDES Permit application serves as the Sludge Management Plan and is approved with the reissuance of the permit.

16. Bases for Special Conditions: Appendix C

17. Material Storage per 9VAC25-31-280.B.2: This permit requires that the facility's O&M Manual include information to address the management of wastes, fluids, and pollutants which may be present at the facility, to avoid unauthorized discharge of such materials.

18. Antibacksliding Review per 9VAC25-31-220.L: This permit complies with the antibacksliding provisions of the VPDES Permit Regulation.

19. Impaired Use Status Evaluation per 9VAC25-31-220.D: This facility discharges into War Branch. War Branch is included in the Smith Creek Total Daily Maximum Load (TMDL) which was approved by EPA on June 4, 2004 for bacteria and benthics and includes the following waste load allocations (WLAs) for this discharge:

    E. coli: 1.74×10^{10} cfu/yr (based on a design flow of 0.01 MGD and a concentration of 126 cfu/100 mL)
    TSS 1,368 lbs/yr (based on a design flow of 0.01 MGD and a concentration of 45 mg/L)

20. Regulation of Users per 9VAC25-31-280.B.9: N/A – There are no industrial users contributing to the treatment works.

21. Stormwater Management per 9VAC25-31-120: Application Required? ☐ Yes ☑ No

    This facility does not have a design flow $\geq$ 1.0 MGD, nor is it required to have an approved POTW pretreatment program under 9VAC25-31-10 et seq.

22. Compliance Schedule per 9VAC25-31-250: There are no compliance schedules included in the reissued permit.

23. Variances/Alternative Limits or Conditions per 9VAC25-31-280.B, 100.K, and 100.N: None

24. Financial Assurance Applicability per 9VAC25-650-10: N/A – This facility does not treat waste generated by facilities not owned by the permittee.

25. Virginia Environmental Excellence Program (VEEP) Evaluation per § 10.1-1187.1-7: At the time of this reissuance, is this facility considered by DEQ to be a participant in the Virginia Environmental Excellence Program in good standing at either the Exemplary Environmental Enterprise (E3) level or the Extraordinary Environmental Enterprise (E4) level? ☐ Yes ☑ No

26. Nutrient Trading Regulation per 9VAC25-820: See Appendix B
    General Permit Required: ☐ Yes ☑ No

27. Nutrient monitoring included per Guidance Memo No. 14-2011: ☑ Yes ☐ No

    This facility is a Nonsignificant Discharger (all facilities not classified as Significant Dischargers as defined in the Nutrient Trading Watershed General Permit Regulation 9 VAC 25-820). Effluent sampling for Total Nitrogen (TN) and Total Phosphorus (TP) has not previously been completed and therefore has been included in the permit.

28. Threatened and Endangered (T&E) Species Screening per 9VAC25-260-20 B.8: Because this is not an issuance or reissuance that allows increased discharge flows, T&E screening is not automatically required. However, in accordance with the VPDES Memorandum of Understanding, T&E screening was coordinated on March 9, 2015 through DGIF based upon request. Comments were received from DGIF on May 13, 2015 and are included in the permit processing file. Comments were considered in the drafting of the permit and were also forwarded to the permittee.

29. Public Notice Information per 9VAC25-31-280.B: All pertinent information is on file, and may be inspected and copied by contacting Megan O'Gorek at: DEQ-Valley Regional Office, P.O. Box 3000, Harrisonburg, Virginia 22801, Telephone No. (540) 574-7845, megan.ogorek@deq.virginia.gov.

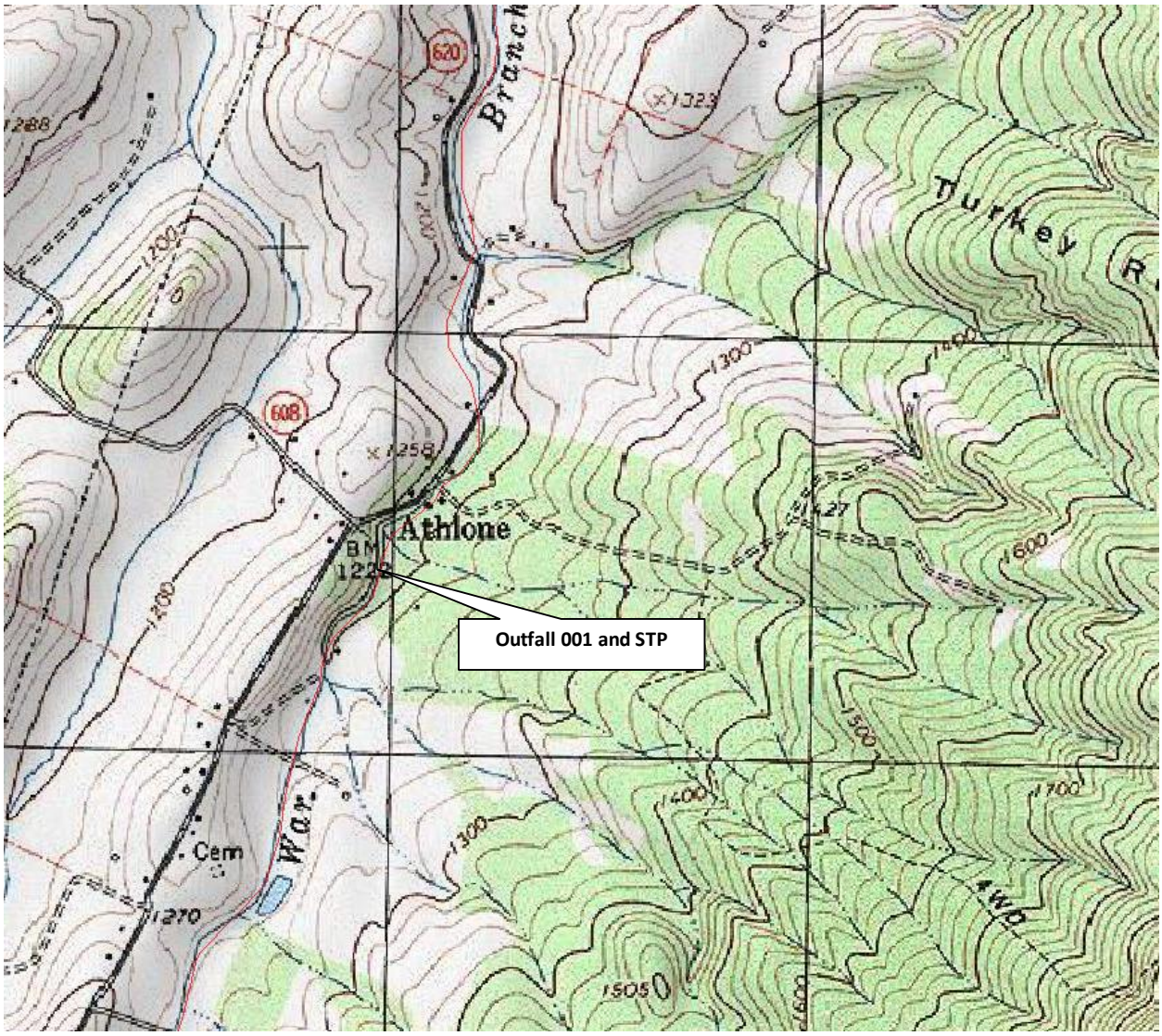
    Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

30. Historical Record: The original permit was issued September 29, 1995. The design flow was 0.01 MGD, and the permit limited pH, $BOD_{5,}$ Chlorine and TSS. The permit was reissued on September 29, 2000 and included limits for the same parameters as the previous permit. At the September 29, 2005 reissuance, Ammonia-N was limited in addition to the parameters in the previous permit. On December 30, 2008, a change of ownership was approved. This also included a facility name change. On September 1, 2010, the permit was reissued and included limits for the same parameters as the previous permit with the addition of E. coli.

APPENDIX A

DISCHARGE LOCATION AND RECEIVING WATERS INFORMATION

This facility discharges to War Branch 4.45 miles above its confluence with Smith Creek in Rockingham County. The topographical map below shows the location of Outfall 001 and the STP.



PLANNING INFORMATION

Relevant points of interest within the watershed and in the vicinity of the discharge are shown on the Water Quality Assessments Review table below.

WATER QUALITY ASSESSMENTS REVIEW
POTOMAC-SHENANDOAH RIVER BASIN
3/11/2015

IMPAIRED SEGMENTS

SEGMENT ID	STREAM	SEGMENT START	SEGMENT END	SEGMENT LENGTH	PARAMETER	
B47R-01-BEN	Fridley Run	2.39	0.00	2.39	Benthic	
B47R-01-PH	Fridley Run	2.39	0.00	2.39	pH	
B47R-02-BAC	Mountain Run/Smith C	5.98, 35.00, 6.81	0.00, 0.00, 6.81	5.98, 35.00, 6.81	E-coli	
B47R-03-BEN	Lacey Spring	0.58	0.00	0.58	Benthic	
B47R-04-BEN	Mountain Run	5.98	0.00	5.98	Benthic	
B47R-05-BEN	Smith Creek	25.19	0.00	25.19	Benthic	

PERMITS

PERMIT	FACILITY	STREAM	RIVER MILE	LAT	LONG	WBID
VA0088994	**Harrisonburg/Shen**	**War Branch**	**4.45**	**383208**	**0784227**	**VAV-B47R**
VA0071846	Endless Caverns Inc	Smith Creek	17.24	383606	0784049	VAV-B47R
VA0077399	Lacey Spring Element	Smith Creek X Trib	0.19	383225	0784550	VAV-B47R
VA0083305	Camp Overlook	Mountain Run	1.60	382948	0784347	VAV-B47R
VA0090794	Mauzy Liberty	Smith Creek	23.18	383325	0784355	VAV-B47R

MONITORING STATIONS

STREAM	NAME	RIVER MILE	RECORD	LAT	LONG	
Dry Fork	1BDFK000.76	0.76	5/11/01	38322	0784544	
Fridley Run	1BFDY000.02	0.02	6/30/03	382937	0784209	
Lacey Springs	1BLAC000.14	0.14	8/8/00	383231	0784545	
Linville Creek	1BLNV001.22	1.22	9/1/93	383624	0784813	
Mountain Run	1BMTR000.93	0.93	6/30/03	382958	0784422	
Smith Creek	1BSMT018.40	18.4	3/3/70	383518	0784207	
Smith Creek	1BSMT019.26	19.26	1/22/09	383518	0784207	
Smith Creek	1BSMT023.18	23.1	7/1/91	383326	0784356	
Smith Creek	1BSMT025.58	25.58		383221	0784532	
Smith Creek	1BSMT025.82	25.82		380313	0791515	
Smith Creek	1BSMT023.58	23.58		383218	0784503	
Smith Creek	1BSMT026.41	26.41	2/11/09	383218	0784503	
Smith Creek	1BSMT028.00	28.00	5/16/01	383128	0784458	
Smith Creek	1BSMT031.69	31.69	5/16/01	382947	0784525	
Dry Fork	1BDFK003.82	3.82	11/17/03	383010	0784809	
Dry Fork	1BDFK004.03	4.03	11/17/03	383005	0784819	
Linville Creek	1BLNV000.71	0.71	4/25/91	383643	0784802	
War Branch	1BWAR003.88	3.88	8/3/05	383255	0784211	

PUBLIC WATER SUPPLY INTAKES

OWNER	STREAM	RIVER MILE				
NEW MARKET, TOWI	Smith Creek	13.4				

WATER QUALITY MANAGEMENT PLANNING REGULATION

Is this discharge addressed in the WQMP regulation? **No**

If Yes, what effluent limitations or restrictions does the WQMP regulation impose on this discharge?

PARAMETER	ALLOCATION					

WATERSHED NAME

VAV-B47R Smith Creek

FLOW FREQUENCY DETERMINATION

The VDEQ conducted several flow measurements of War Branch at Athlone near Tenth Legion, VA (#01632870) between 2000 and 2001. The measurements correlated well with the same day daily mean values from the continuous record gage on Smith Creek near New Market, VA (#01632900). The measurements and daily mean values were plotted on a logarithmic graph and a best fit line was drawn though each set of data points. The required flow frequencies from the reference gage were plugged into the equation and the associated flow frequencies for the measurement site were calculated. The flow frequencies at the discharge point were determined by using the calculated flow frequency values at the measurement site and adjusting them by proportional drainage areas. The data for the reference gage, measurement site, and the discharge point are presented below. This analysis assumes there are no significant discharges, withdrawals or springs between the gage and the discharge point.

Smith Creek near New Market, VA (#01632900):

Drainage Area = 93.6 mi^2

1Q30 =	4.7 cfs	High Flow 1Q10 =	13.4 cfs
1Q10 =	6.58 cfs	High Flow 7Q10 =	15.4 cfs
7Q10 =	7.25 cfs	High Flow 30Q10 =	18.6 cfs
30Q10 =	8.47 cfs	HM =	31.3 cfs
30Q5 =	10.5 cfs		

War Branch at Athlone near Tenth Legion, VA (#01632870):

Drainage Area = 3.11 mi^2

1Q30 =	0.00344 cfs	High Flow 1Q10 =	0.0604 cfs
1Q10 =	0.00864 cfs	High Flow 7Q10 =	0.0883 cfs
7Q10 =	0.0112 cfs	High Flow 30Q10 =	0.148 cfs
30Q10 =	0.0172 cfs	HM =	0.614 cfs
30Q5 =	0.0310 cfs		

War Branch at the discharge point:

Drainage Area = 3.75 mi^2

1Q30 =	0.00415 cfs	(0.00268 MGD)	High Flow 1Q10 =	0.0728 cfs	(0.0471 MGD)
1Q10 =	0.0104 cfs	(0.00673 MGD)	High Flow 7Q10 =	0.106 cfs	(0.0688 MGD)
7Q10 =	0.0136 cfs	(0.00881 MGD)	High Flow 30Q10 =	0.178 cfs	(0.115 MGD)
30Q10 =	0.0207 cfs	(0.0134 MGD)	HM =	0.740 cfs	(0.478 MGD)
30Q5 =	0.0374 cfs	(0.0242 MGD)			

The high flow months are January through May.

Reviewer: DMJ
3/6/15

EFFLUENT/STREAM MIXING EVALUATION

Mixing zone predictions were made with the Virginia DEQ Mixing Zone Analysis Version 2.1 program. The predictions are based on the discharge and receiving stream characteristics, and are presented below.

Annual	**Wet Season**
Effluent Flow = 0.01 MGD Stream 7Q10 = 0.00881 MGD Stream 30Q10 = 0.0134 MGD Stream 1Q10 = 0.00673 MGD Stream slope = 0.0085 ft/ft Stream width = 2 ft Bottom scale = 3 Channel scale = 1	Effluent Flow = 0.01 MGD Stream 7Q10 = 0.0688 MGD Stream 30Q10 = 0.115 MGD Stream 1Q10 = 0.0471 MGD Stream slope = 0.0085 ft/ft Stream width = 4 ft Bottom scale = 3 Channel scale = 1
--- Mixing Zone Predictions @ 7Q10 Depth = .0711 ft Length = 33.05 ft Velocity = .2048 ft/sec Residence Time = .0019 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.	--- Mixing Zone Predictions @ 7Q10 Depth = .1101 ft Length = 92.66 ft Velocity = .2769 ft/sec Residence Time = .0039 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.
--- Mixing Zone Predictions @ 30Q10 Depth = .0813 ft Length = 29.36 ft Velocity = .2226 ft/sec Residence Time = .0015 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.	--- Mixing Zone Predictions @ 30Q10 Depth = .1462 ft Length = 72.36 ft Velocity = .3308 ft/sec Residence Time = .0025 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.
--- Mixing Zone Predictions @ 1Q10 Depth = .066 ft Length = 35.31 ft Velocity = .1957 ft/sec Residence Time = .0501 hours Recommendation: A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.	--- Mixing Zone Predictions @ 1Q10 Depth = .0904 ft Length = 110.01 ft Velocity = .2443 ft/sec Residence Time = .1251 hours Recommendation: A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

APPENDIX B

EFFLUENT SCREENING AND EFFLUENT LIMITATIONS

EFFLUENT LIMITATIONS

A comparison of technology and water quality-based limits was performed and the most stringent limits were selected, as summarized in the table below.

Outfall 001 **Final Limits** **Design Flow: 0.01 MGD**

PARAMETER	BASIS FOR LIMITS	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average		Maximum		Frequency	Sample Type
Flow (MGD)	1	NL		NL		1/Day	Estimate
---	---	Monthly Average		Weekly Average		---	---
BOD_5	2,3,4	30 mg/L	1.1 kg/d	45 mg/L	1.7 kg/d	1/Month	Grab
TSS	2,6	30 mg/L	1.1 kg/d	45 mg/L	1.7 kg/d	1/Month	Grab
Ammonia-N (Jun-Dec)(mg/L)	3	5.2		5.2		1/Month	Grab
Effluent Chlorine (TRC)(mg/L)*	3	0.015		0.019		1/Day	Grab
E. coli (N/100 mL) (geometric mean)	3,6	126		NA		4/Month in any month of each calendar year* or 4/Month** 10 am to 4 pm	Grab
----------	------	Annual Average		Maximum		----------	----------
pH (S.U.)	3	6.5		9.5		1/Day	Grab
Dissolved Oxygen (mg/L)	3,4	2.5		NA		1/Day	Grab
Contact Chlorine (TRC)(mg/L)*	3,5	1.0		NA		1/Day	Grab
TKN (mg/L)	7	NA		NL		1/Year	Grab
Nitrite-N + Nitrate-N (mg/L)	7	NA		NL		1/Year	Grab
Total Nitrogen (mg/L)	7	NA		NL		1/Year	Calculated
Total Phosphorus (mg/L)	7	NA		NL		1/Year	Grab

NL = No Limitation, monitoring required *NA = Not Applicable*

4/Month = 4 samples taken monthly, with at least 1 sample taken each calendar week

4/Month in any month of each calendar year = 4 samples taken, with at least 1 sample taken each calendar week, in any calendar month and reported with the DMR due January 10th of every year

1/Year = Annual sampling with the results submitted with the DMR due January 10th of each year

* = *Applicable only when chlorination is used for disinfection*

** = *Applicable if an alternative to chlorination is used for disinfection.*

BASIS DESCRIPTIONS

1. *VPDES Permit Regulation (9VAC25-31)*
2. *Federal Effluent Requirements (Secondary Treatment Regulation - 40CFR133)*
3. *Water Quality Standards (9VAC25-260)*
4. *Regional Stream Model simulation (v.4.11)*
5. *Best Professional Judgment (BPJ)*
6. *Smith Creek TMDL*
7. *Guidance Memo No. 14-2011*

LIMITING FACTORS – OVERVIEW:
The following potential limiting factors have been considered in developing this permit and fact sheet:

Water Quality Management Plan Regulation (WQMP) (9VAC25-720)	
A. TMDL limits	**E. coli, TSS**
B. Non-TMDL WLAs	**None**
C. CBP (TN & TP) WLAs	**None**
Federal Effluent Guidelines	**BOD_5, TSS, pH**
BPJ/Agency Guidance limits	**TRC (contact), pH, TN, TP, Nitrite-N + Nitrate-N, TKN**
Water Quality-based Limits - numeric	**BOD_5, DO, TRC (effluent), E. coli, pH, Ammonia-N**
Water Quality-based Limits - narrative	**None**
Technology-based Limits (9VAC25-40-70)	**None**
Whole Effluent Toxicity (WET)	**Not Applicable**
Storm Water Limits	**Not Applicable**

EVALUATION OF THE EFFLUENT – CONVENTIONAL POLLUTANTS:
The discharge from this facility was previously modeled using the Regional Stream Model. At this reissuance the discharge was remodeled using the Regional Stream Model (v. 4.11) because new stream flow and temperature data were available. The modeling information is available for review at the DEQ-VRO or electronically upon request. Since War Branch is a Tier 1 stream, a DO baseline was not established.

It was determined that the following effluent concentrations are protective of downstream WQS:

	(Jun-Dec)	(Jan-May)
$CBOD_5$ (mg/L)	25	25
TKN (mg/L)	5.6	20
DO (mg/L)	2.5	2.5

Because a $CBOD_5$ concentration of 25 mg/L is equivalent to a BOD_5 concentration of 30 mg/L, a BOD_5 permit limit of 30 mg/L has been carried forward from the previous permit.

Because the modeled effluent TKN (Jun-Dec) was more than two times the Ammonia-N WLA, it was determined that no TKN limits were needed because the Ammonia-N (Jun-Dec) limits imposed in this permit will control TKN.

The effluent TKN (Jan-May) concentration was modeled at 20 mg/L, which is equivalent to the maximum concentration expected in a municipal STP effluent. TKN (Jan-May) limits are not required to ensure the effluent TKN concentration does not exceed 20 mg/L.

The DO limits have been carried forward from the previous permit. The sampling frequency has been changed to 1/Day instead of 1/Week as in the previous permit. The VPDES Permit Manual recommends 1/Day sampling for a facility of this size and the permittee is currently sampling DO daily.

The TSS limits are consistent with the Secondary Treatment Regulation, are consistent with the TMDL WLA of 1,368 lbs/yr, and have been carried forward from the previous permit.

The pH limits reflect the current WQS for pH in the receiving stream and have been carried forward from the previous permit.

EVALUATION OF THE EFFLUENT – DISINFECTION:

The TRC disinfection requirements have been carried forward from the previous permit. In addition to the minimum TRC contact requirements, the permit requires E. coli monitoring of 4/Month sampling during at least 1 month in each calendar year of the permit term to demonstrate compliance with the monthly geometric mean limit and to ensure adequate disinfection. This additional E. coli monitoring has been imposed in accordance with Guidance Memo No. 14-2003 and reflects a change in the previous monitoring frequency of 2/Month. If an alternative to chlorination is utilized, E. coli monitoring at a frequency of 4/Month (previously expressed as 1/Week) and an associated limit have been carried forward from the previous permit. The E. coli limits are consistent with the TMDL WLA of 1.74×10^{10} cfu/yr and are protective of the current WQS for E. coli in the receiving stream.

EVALUATION OF THE EFFLUENT – NUTRIENTS:

In accordance with § 62.1-44.19:14.C.5. of the Code of Virginia, TN and TP baselines are being established for this facility to represent nutrient discharge allowances as of July 1, 2005. These baselines will be used as a limiting factor should the facility ever expand to a design flow of 0.040 mgd or greater.) For municipal facilities, the baselines are based on the permitted design capacity of the facility. The permitted design capacity is defined as:

Total N or P (lb/yr) = concentration (mg/L) x design flow (MGD) x 8.345 x 365 (days/yr)

where:

Design flow – as of July 1, 2005, the approved flow was 0.010 MGD
Concentration – the treatment provided as of July 1, 2005 was TN = 18.7 mg/L and TP = 2.5 mg/L (assumed concentrations based on secondary treatment facility)

TN = 18.7 mg/l x 0.010 MGD x 8.345 x 365 days/yr = 570 lb/yr
TP = 2.5 mg/l x 0.010 MGD x 8.345 x 365 days/yr = 76 lb/yr

The "permitted design capacity" or "permitted capacity" in terms of annual mass load of total nitrogen or total phosphorus discharged by this non-significant discharger is assumed to be that achieved at the current design flow using the currently installed technology.

Nonsignificant dischargers are subject to aggregate wasteload allocations for TN, TP, and Sediment under the TMDL for the Chesapeake Bay. In accordance with Guidance Memo No. 14-2011, monitoring of TN and TP is required for this permit term in order to verify the aggregate WLAs.

EVALUATION OF THE EFFLUENT – TOXICS:

Stream: Outfall 001 is located on War Branch, which flows into Smith Creek. Water quality data for the receiving stream were obtained from Ambient Monitoring Station No. 1BWAR003.88 on War Branch at the Rt. 620 Bridge located approximately 0.5 miles downstream of the discharge point. All toxic pollutants, including Ammonia-N and TRC, are assumed absent in the receiving stream because there are no data for these parameters directly above the discharge.

Stream Information			
90% Annual Temp (°C) =	19.9	90% pH (SU) =	8.4
90% Wet Temp (°C) =	11.8	10% pH (SU) =	7.8
Mean Hardness (mg/L) =	124		

Discharge: The pH and temperature values were obtained from data submitted by the permittee. The hardness value was assumed equal to the receiving stream.

Effluent Information			
90% Annual Temp (°C) =	21.8	90% pH (SU) =	8.1
90% Wet Temp (°C) =	17.4	10% pH (SU) =	7.0
Mean Hardness (mg/L) =	124		

WQC and WLAs were calculated for the WQS parameters for which data are available. The resulting WQC and WLAs are presented in this appendix. Current agency guidelines recommends the evaluation of toxic pollutant limits for TRC and Ammonia-N be based on default effluent concentrations of 20 mg/L and 9 mg/L, respectively. The effluent data were analyzed per the protocol for evaluation of effluent toxic pollutants included in this appendix with the following results:

- TRC: The TRC limits have been carried forward from the previous permit.
- Ammonia-N: Less stringent Ammonia-N (Jun-Dec) limits have been determined to be necessary at this reissuance due to new effluent temperature and pH data. New stream temperature, stream flow, and effluent pH data resulted in the determination that no Ammonia-N (Jan-May) are necessary. Both the less stringent Ammonia-N (Jun-Dec) limits and the removal of the Ammonia-N (Jan-May) limits meet the antibacksliding requirements because new information was available.

WQC-WLA SPREADSHEET INPUT

WATER QUALITY CRITERIA / WASTE LOAD ALLOCATION ANALYSIS

Facility Name: Harrisonburg/Shenandoah Valley KOA
Receiving Stream: War Branch
Permit No.: VA0088994
Date: 6/9/2015
Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information			Effluent Information	
Mean Hardness (as CaCO3) =	124 mg/L	1Q10 (Annual) =	0.00673 MGD	Annual	- 1Q10 Flow =	100 %	Mean Hardness (as CaCO3) =	124 mg/L
90% Temperature (Annual) =	19.9 deg C	7Q10 (Annual) =	0.00881 MGD		- 7Q10 Flow =	100 %	90% Temp (Annual) =	21.8 deg C
90% Temperature (Wet season) =	11.8 deg C	30Q10 (Annual) =	0.0134 MGD		- 30Q10 Flow =	100 %	90% Temp (Wet season) =	17.4 deg C
90% Maximum pH =	8.4 SU	1Q10 (Wet season) =	0.0471 MGD	Wet Season	- 1Q10 Flow =	100 %	90% Maximum pH =	8.1 SU
10% Maximum pH =	7.8 SU	30Q10 (Wet season) =	0.115 MGD		- 30Q10 Flow =	100 %	10% Maximum pH =	7.0 SU
Tier Designation =	1	30Q5 =	0.0242 MGD				Current Discharge Flow =	0.01000 MGD
Public Water Supply (PWS) Y/N? =	N	Harmonic Mean =	0.478 MGD				Discharge Flow for Limit Analysis =	0.01000 MGD
V(alley) or P(iedmont)? =	V							
Trout Present Y/N? =	N							
Early Life Stages Present Y/N? =	Y							

Footnotes:

1. All concentrations expressed as micrograms/ liter (ug/ l), unless noted otherwise.
2. All flow values are expressed as Million Gallons per Day (MGD).
3. Discharge volumes are highest monthly average or 2C maximum for Industries and design flows for Municipals.
4. Hardness expressed as mg/ l CaCO3. Standards calculated using Hardness values in the range of 25-400 mg/ l CaCO3.
5. "Public Water Supply" protects for fish & water consumption. "Other Surface Waters" protects for fish consumption only.
6. Carcinogen "Y" indicates carcinogenic parameter.
7. Ammonia WQSs selected from separate tables, based on pH and temperature.
8. Metals measured as Dissolved, unless specified otherwise.
9. WLA = Waste Load Allocation (based on standards).
10. WLA = Waste Load Allocation (based on standards).
11. WLAs are based on mass balances (less background, if data exist).
12. Acute - 1 hour avg. concentration not to be exceeded more than 1/ 3 years.
13. Chronic - 4 day avg. concentration (30 day avg. for Ammonia) not to be exceeded more than 1/ 3 years.
14. Mass balances employ 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens, and Harmonic Mean for Carcinogens. Actual flows employed are a function of the mixing analysis and may be less than the actual flows.
15. Effluent Limitations are calculated elsewhere using the minimum WLA and EPA's statistical approach (Technical Support Document).

WQC-WLA SPREADSHEET OUTPUT

Facility Name: Harrisonburg/ Shenandoah Valley KOA
Receiving Stream: War Branch
Permit No.: VA0088994
Date: 6/9/2015

		WATER QUALITY CRITERIA (0.010 MGD Discharge Flow - Mix per "Mixer")				NON-ANTIDEGRADATION WASTE LOAD ALLOCATIONS (0.010 MGD Discharge - Mix per "Mixer")			
		Aquatic Protection		Human Health		Aquatic Protection		Human	Target
Toxic Parameter and Form	Carcinogen?	Acute	Chronic	Public Water Supplies	Other Surface Waters	Acute	Chronic	Health	Level
Ammonia-N (Annual)	N	5.8E+00 mg/L	1.1E+00 mg/L	None	None	9.6E+00 mg/L	2.6E+00 mg/L	N/A	N/A
Ammonia-N (Wet Season)	N	4.4E+00 mg/L	1.4E+00 mg/L	None	None	2.5E+01 mg/L	1.7E+01 mg/L	N/A	N/A
Chlorine, Total Residual	N	1.9E-02 mg/L	1.1E-02 mg/L	None	None	3.2E-02 mg/L	2.1E-02 mg/L	N/A	N/A

PROTOCOL FOR THE EVALUATION OF THE EFFLUENT – TOXIC POLLUTANTS

Toxic pollutants were evaluated in accordance with OWP Guidance Memo No. 00-2011. According to this guidance, STPs with a design flow ≤ 0.040 MGD are treated as if there are no toxic pollutants in their discharge unless there is actual evidence to indicate otherwise. This applies to all toxic pollutants with the exception of Ammonia and Total Residual Chlorine, which are evaluated in every STP discharge. Also, these smaller STPs are not required to monitor for any toxic pollutants unless there is reason to believe that such pollutants may be present.

Acute and Chronic WLAs (WLA_a and WLA_c) were analyzed according to the protocol below using a statistical approach (STAT.exe) to determine the necessity and magnitude of limits. Human Health WLAs (WLA_{hh}) were analyzed according to the same protocol through a simple comparison with the effluent data. If the WLA_{hh} exceeded the effluent datum or data mean, no limits were required. If the effluent datum or data mean exceeded the WLA_{hh}, the WLA_{hh} was imposed as the limit.

Since there are no data available for any toxic pollutants immediately upstream of this discharge, all upstream background pollutant concentrations are assumed to be "0".

The steps used in evaluating available effluent data from STPs with design flows ≤ 0.040 MGD are as follows:

A. If all data are reported as "below detection" or < the required Quantification Level (QL) (or, for metals, in a form other than "dissolved"), then the data are not suitable for analysis and no further monitoring is required.

B. If any data value is reported as detectable at or above the required QL, then the data are adequate to determine whether effluent limits are needed.

   B.1. If the evaluation indicates that no limits are needed, then no further monitoring is required.

   B.2. If the evaluation indicates that limits are needed, then the limits and associated requirements are specified in the draft permit.

Parameter	CASRN	QL	Data	Source of Data	Data Eval
Ammonia-N (mg/L) (Annual)	766-41-7	0.2 mg/L	**Default = 9 mg/L**	**a**	**B.2**
Ammonia-N (mg/L) (Wet Season)	766-41-7	0.2 mg/L	**Default = 9 mg/L**	**a**	**B.1**
TRC (mg/L)	7782-50-5	0.1 mg/L	**Default = 20 mg/L**	**a**	**B.2**

CASRN = Chemical Abstract Service Registry Number for each parameter is referenced in the current Water Quality Standards. A unique numeric identifier designating only one substance. The Chemical Abstract Service is a division of the American Chemical Society.

"Source of Data" codes:
a = default effluent concentration

"Data Evaluation" codes:
See section titled PROTOCOL FOR THE EVALUATION OF EFFLUENT TOXIC POLLUTANTS for an explanation of the code used.

STAT.EXE RESULTS

Ammonia-N (Annual)	**Ammonia-N (Wet Season)**	**TRC**
Chronic averaging period = 30 WLAa = 9.6 WLAc = 2.6 Q.L. = 0.2 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 1 Expected Value = 9 Variance = 29.16 C.V. = 0.6 97th percentile daily values = 21.9007 97th percentile 4 day average = 14.9741 97th percentile 30 day average= 10.8544 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data A limit is needed based on Chronic Toxicity Maximum Daily Limit = 5.24594224288241 Average Weekly Limit = 5.24594224288241 Average Monthly Limit = 5.24594224288241 The data are: 9	Chronic averaging period = 30 WLAa = 25 WLAc = 17 Q.L. = 0.2 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 1 Expected Value = 9 Variance = 29.16 C.V. = 0.6 97th percentile daily values = 21.9007 97th percentile 4 day average = 14.9741 97th percentile 30 day average= 10.8544 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data No Limit is required for this material The data are: 9	Chronic averaging period = 4 WLAa = 0.032 WLAc = 0.021 Q.L. = 0.1 # samples/mo. = 30 # samples/wk. = 7 Summary of Statistics: # observations = 1 Expected Value = 20 Variance = 144 C.V. = 0.6 97th percentile daily values = 48.6683 97th percentile 4 day average = 33.2758 97th percentile 30 day average= 24.1210 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data A limit is needed based on Chronic Toxicity Maximum Daily Limit = 3.07140704651179E-02 Average Weekly Limit = 1.87573041817371E-02 Average Monthly Limit = 1.52225433510356E-02 The data are: 20

APPENDIX C

BASES FOR PERMIT SPECIAL CONDITIONS

Tabulated below are the sections of the permit, with any changes and the reasons for the changes identified. Also provided is the basis for each of the permit special conditions.

Cover Page
- Content and format as prescribed by the Guidance Memo No. 14-2003.

Part I.A

Effluent Limitations and Monitoring Requirements: Bases for effluent limits and monitoring requirements provided in previous pages of fact sheet.

Updates Part I.A.1 of the previous permit with the following:

- Minor changes were made to the format and introductory language.
- Less stringent Ammonia-N limits (Jun-Dec) were included.
- Ammonia-N limits (Jan-May) were removed.
- Monitoring requirements for E. coli were changed from 2/Month to 4/Month in one month per year.
- Monitoring requirements for DO were changed from 1/Week to 1/Day.
- The Schedule of Compliance footnote was removed.
- Annual monitoring for TP, TKN, Nitrite-N + Nitrate-N, and TN was added per Guidance Memo No. 14-2011.

Part I.

Additional Total Residual Chlorine (TRC) and E. coli Effluent Limitations and Monitoring Requirements: *Updates Part I.C of the previous permit with minor wording changes.* Required by Sewage Collection and Treatment (SCAT) Regulations, 9VAC25-790 and Water Quality Standards, 9VAC25-260-170, Bacteria; other waters. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This ensures proper operation of chlorination equipment to maintain adequate disinfection.

Part I.C

Effluent Limitations and Monitoring Requirements – Additional Instructions*: Updates Part I.D of the previous permit with minor wording changes and adding nutrient reporting instructions. Also, the QL for BOD_5 was changed from 5.0 mg/L to 2 mg/L.* Authorized by VPDES Permit Regulation 9 VAC25-31-190 J.4 and 220.I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

Part I.D.1

95% Capacity Reopener: *Updates Part I.E.1 of the previous permit with minor wording changes*. Required by VPDES Permit Regulation 9VAC25-31-200 B 4 for Publicly Owned Treatment Works (POTW) and Privately Owned Treatment Works (PVOTW) permits.

Part I.D.2

Indirect Dischargers: *Identical to Part I.E.2 of the previous permit.* Required by VPDES Permit Regulation 9VAC25-31-200.B.1 and B.2 for Publicly Owned Treatment Works (POTW) and Privately Owned Treatment Works (PVOTW) that receive waste from someone other than the owner of the treatment works.

Part I.D.3

Materials Handling/Storage: *Updates Part I.E.3 of the previous permit.* 9VAC25-31-50.A prohibits the discharge of any waste into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

Part I.D.4 **O&M Manual Requirement:** *Updates Part I.E.4 of the previous permit with changes to what is required to be included in the O&M Manual.* Required by Code of Virginia Section 62.1-44.19, Sewage Collection and Treatment (SCAT) Regulations 9VAC25-790, and VPDES Permit Regulation 9VAC25-31-190.E for all STPs.

Part I.D.5 **CTC/CTO Requirement:** *Identical to Part I.E.5 of the previous permit.* Required by Code of Virginia 62.1-44.19, Sewage Collection and Treatment (SCAT) Regulations 9VAC25-790, and VPDES Permit Regulation 9VAC25-31-190.E for all STPs. 9VAC25-40-70.A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade.

Part I.D.6 **SMP Requirement:** *Identical to Part I.E.6 of the previous permit.* VPDES Permit Regulation 9VAC25-31-100.Q, 220.B.2, and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. Technical requirements are derived from the Virginia Pollution Abatement Permit Regulation (9VAC25-32-10 *et seq.*)

Part I.D.7 **Reliability Class:** *Identical to Part I.E.7 of the previous permit.* Required by Sewage Collection and Treatment (SCAT) Regulations 9VAC25-790 for all municipal facilities. Class II status recommended by VDH for this facility on 9/29/05.

Part I.D.8 **Treatment Works Closure Plan**. *Updates Part I.E.8 of the previous permit with minor wording changes*. This condition establishes the requirement to submit a closure plan for the treatment works if the treatment facility is being replaced or is expected to close. This is necessary to ensure industrial sites and treatment works are properly closed so that the risk of untreated waste water discharge, spills, leaks and exposure to raw materials is eliminated and water quality maintained. Section 62.1-44.21 requires every owner to furnish when requested plans, specification, and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purposes of the State Water Control Law.

Part I.D.9 **Reopeners:**

a. *Identical to Part I.E.9.a of the previous permit.* Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.

b. *Updates Part I.E.9.b of the previous permit with minor wording changes.* 9VAC25-31-390.A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

c. *Identical to Part I.E.9.c of the previous permit.* Required by the VPDES Permit Regulation 9VAC25-31-220.C, for all permits issued to treatment works treating domestic sewage.

Part II **Conditions Applicable to All VPDES Permits:** *Updates Part II of the previous permit.* VPDES Permit Regulation 9VAC25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

Deletions:

Part I.B **Interim Limits and Schedule of Compliance:** The schedule of compliance for Dissolved Oxygen and Ammonia-N (Jun-Dec) was removed as the facility has achieved compliance with final limits.